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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/648,450	08/27/2003	Arthur E. Dixon	58305.0007	9643

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EXAMINER

CONSILVIO, MARK J

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 03/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

ELC

Office Action Summary	Application No. 10/648,450	Applicant(s) DIXON ET AL.	
	Examiner Mark Consilvio	Art Unit 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
 4a) Of the above claim(s) 17, 20, 31, 36-38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 13-28 and 31-42 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☒ Claim(s) 9-12, 29 and 30 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Election/Restrictions

Applicant's election of Species I in the reply filed on 12/23/2004 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Therefore, claims 9-12, 29, and 30 are withdrawn from consideration.

Claim Objections

Claims 17, 20, 31, and 36-38 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims 17, 20, 31, and 36-38 have not been further treated on the merits.

Claim 25 recites the limitation "water and oil" in its last line. There is insufficient antecedent basis for this limitation in the claim. For the purposes of examination, this limitation will be read as "water or oil."

Claim 26 recites the limitation "a spot and a line" in its last line. There is insufficient antecedent basis for this limitation in the claim. For the purposes of examination, this limitation will be read as "a spot or a line."

Applicant is advised that should claim 6/5/1 be found allowable, claim 40 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an

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application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 8, 14, 16/1, 16/2/1, 16/3/1, 18/1, 18/2/1, 18/3/1, 19/1, 19/2/1, 19/3/1, 21/1, 21/2/1, 21/3/1, 23/1, 23/2/1, 23/3/1, 24/1, 24/2/1, 24/3/1, 26/1, 26/2/1, 26/3/1, 27, 39/1, 39/2/1, 39/3/1, 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dixon et al. (US Patent No. 5,532,873) in view of Engelhardt et al. (US Patent No. 6,285,019).

With respect to claim 1, Dixon et al. discloses an imaging system for imaging objects, said system comprising: (a) an illumination source (102) producing a light beam (103) directed upon an optical path toward an object (130); (b) a scan lens (302) for focusing said light beam to a diffraction-limited configuration in a prescribed object plane, said scan lens having an external entrance pupil (304); (c) a scanner (114, 120) for scanning said light beam to move said diffraction-limited configuration in a pre-determined scan pattern on said object plane (col. 4, lines 38-62); (d) said scan lens (302) being movable relative to said object to achieve coarse focusing (col. 4, line 63-col. 5, line 14); (e) a focusing lens (108, 136, 200, etc.); and (f) a detector (156) located to receive light from said object plane and a display (412) to produce a

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signal from said detector (fig. 3a). Though Dixon et al. teaches a focusing lens may be placed at different positions depending on the focal length of the lens used, Dixon et al. does not expressly disclose a focal lens being movable relative to said scan lens to achieve fine focusing. However, the moving of focusing lenses to adjust the focus of a microscope is old and well known in the art. Engelhardt et al. teaches an objective lens system for a confocal scanning microscope wherein a lens focus (8) is moved relative to a scan lens (11) for fine focusing (fig. 1). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teachings of Dixon et al. and Engelhardt et al. to provide an imaging system with a focus lens movable relative to a scan lens for a variety of reasons including allowing the system to continuously scan an object in three dimensions without having to object relative to the microscope objective during scanning (Engelhart col. 2, lines 51-56).

With respect to claim 2, Engelhart et al. discloses the scan lens is in a fixed position relative to said object during fine focusing (col. 2, lines 51-56). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teachings of Dixon et al. and Engelhardt et al. to further limit the required operation of the imaging system.

With respect to claim 3, Dixon et al. and Engelhardt et al. show a focusing lens is located between the object (130) and the light source (102) (fig. 3a).

With respect to claim 4, Engelhart et al. Dixon et al. show the focusing lens is located between a light source (2) and a detector (3). Here, since it is generally understood that the figures show are a schematic of the optical arrangement, location is read to follow the path of the

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light beam. Thus, the path of the light beam begins with the illumination source and ends with the detector as shown in both Dixon et al. (fig. 3a) and Engelhardt et al (fig. 1).

With respect to claim 5, Engelhardt et al. discloses a focusing lens (8) is located between a detector (5) and a scanner (10) (fig. 1). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teachings of Dixon et al. and Engelhardt et al. to provide this optical arrangement to vary the optically effective pinhole diaphragm diameter (abstract).

With respect to claim 8, Dixon et al. discloses the system is a confocal imaging system and there is a detection arm (138, 136) located between said scanner (114, 120) and said detector (140), said detection arm receiving light from said diffraction-limited configuration in said object plane, said detection arm having a pinhole (138) and a focusing lens (136) to obtain a focal point for confocal detection of said light returning from said object, said detector being located behind said pinhole, there being a beamsplitter (112) located between said detection arm and said object, said beamsplitter directing light returning from said object into said detection arm (fig. 3a).

With respect to claim 14, Engelhardt et al. discloses the system is constructed to allow fine focusing during operation of said system to image said object (col. 2, lines 51-56). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teachings of Dixon et al. and Engelhardt et al. to allow for fine focusing to be able to carry out continuous depth discrimination (abstract).

With respect to claim 16, Dixon et al. discloses the scan lens (400) is a telecentric $f^*\theta$ scan lens (fig. 4a).

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With respect to claim 18, Dixon et al. discloses there are means for supporting (208) said object (130) to be imaged (fig. 3a).

With respect to claim 19, Dixon et al. discloses there is a support (208) for said object (130) to be imaged, said support being capable of moving said object relative to said system (col. 3, lines 4-5).

With respect to claims 21 and 39, Dixon et al. discloses said illumination source (102) is a laser (fig. 3a).

With respect to claim 23, Dixon et al. implies the system is configured to be controlled by a computer (col. 4, lines 58-63).

With respect to claim 24, Dixon et al. discloses the imaging system is a macroscope and said system can be operated to image an object in reflected light, transmitted light, fluorescence, photoluminescence or multi-photon fluorescence (abstract).

With respect to claim 26, Dixon et al. discloses said diffraction-limited configuration is one of a spot or a line (col. 4, lines 46-49).

With respect to claim 27, Dixon et al. discloses said system has a beam expander (104, 106, 108), said beam expander being located to expand said light beam prior to said light beam entering said beamsplitter (112) (fig. 3a).

With respect to claim 41, Dixon et al. discloses a method of imaging an object using an imaging system having an illumination source producing a light beam directed along an optical path towards said object, a scan lens having an external entrance pupil for focusing said light beam to a diffraction-limited configuration in a prescribed object plane, a scanner for scanning said light beam to move said diffraction-limited configuration in a pre-determined scan pattern

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on said object plane, a detector being located to receive light from said object plane and a display to produce a signal from said detector, as discussed supra regarding claim 1. Further, Dixon et al. teaches a method comprising moving said scan lens relative to said object to coarse focus said system (col. 3, lines 3-4). Dixon et al. is silent to subsequently maintaining said scan lens in a fixed position relative to said object and moving a focusing lens relative to said scan lens to fine-focus said system. However, Engelhardt et al. teaches such a step is desirable. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teachings of Dixon et al. and Engelhardt et al. to maintain the scan lens in a fixed position relative to the object and move a focusing lens relative to the scan lens to fine-focus the system to allow the system to scan an object without having to object relative to the microscope objective during scanning and to adjust the light incident upon the detection pinhole relieving the need of a micromechanical system (col. 2, lines 51-67).

With respect to claim 42, the combination of Dixon et al. and Engelhardt et al. discloses or suggests the limitations of claim 42 as discussed supra regarding claim 41. The combination further discloses the imaging system having a laser as an illumination source. While the combination is silent to the intensity of said laser being controllable, such control is inherent to all laser systems since some degree of control over intensity can always be exhibited by switching the laser on and off. Also, the examiner notes that the limitation, "to use said system as an imaging system and as a laser guided surgery or microsurgery system" is an intended use type limitation. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of

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performing the intended use, then it meets the claimed limitation. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Claims 6/4/1, 6/5/1, 8, 15/1, 15/2/1, 15/3/1, 22/1, 22/2/1, 22/3/1, 28, 32/1, 32/2/1, 32/3/1, 33/1, 33/2/1, 33/3/1, 34/1, 34/2/1, 34/3/1, 35/1, 35/2/1, 35/3/1, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dixon et al. (US Patent No. 5,532,873) in view of Engelhardt et al. (US Patent No. 6,285,019) and in further view of White et al. (US Patent No. 6,169,289).

With respect to claims 6 and 40, the combination of Dixon et al. and Engelhardt et al. discloses all the limitations of claims 4 and 5. Neither reference specifically discloses the imaging system is a multi-photon or two-photon system. However, White et al. discloses a multi-photon or two-photon system may be used for florescence microscopy. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teachings of White et al., Dixon et al., and Engelhardt et al. to provide an imaging system capable of multi-photon or two-photon excitation for the best imaging of fluorescent objects.

With respect to claim 8, while Dixon et al. and Engelhardt et al. are silent to an immersion lens, White et al. discloses the scan lens is a liquid-immersion scan lens and shows there is an immersion liquid between the scan lens and the object when the system is operational (fig. 1). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the teachings of Dixon et al. with the arrangement of White et al. “to enhance the collection of the fluorescent photons from the specimen...” (col. 6, lines 8-9).

With respect to claim 15, Dixon et al. discloses the scan lens may be a telecentric $f^*\theta$ scan lens (400) (fig. 4a). The modification to a liquid immersion scan lens has been described supra regarding claim 7.

With respect to claims 22 and 28, White et al. discloses a laser rejection filter (not shown) is placed in front of a detector (35), said imaging system being a multi-photon or two-photon imaging system whereby an illumination source (11) is a short pulse laser to excite multi-photon or two-photon fluorescence respectively in a object (22) (col. 5, line 47-col. 6, line 45). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the teachings of Dixon et al. and Engelhardt et al. with the arrangement of White et al. to provide maximum resolution for the imaging system.

With respect to claim 25, White et al. discloses said immersion liquid is one of water or oil (col. 6, lines 44-46).

With respect to claims 32-35, White et al., Dixon et al., and Engelhardt et al. disclose all the limitations of claims 1-3 and variety of possible uses for the imaging system. The combination as disclosed above teaches or suggests all the structure needed to meet the limitations of claims 32-35. The examiner notes that these claims include limitations that are intended use type limitations. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claimed limitation. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Claims 7 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dixon et al. (US Patent No. 5,532,873) in view of Engelhart et al. (US Patent Application No. 2003/0103263) and in further view of Guerra (US Patent No. 5,349,443).

With respect to claim 7, Dixon et al. and Engelhardt et al. teach or suggest all the limitations of claim 1 as stated supra. Dixon et al. and Engelhardt et al. are silent to the limitations of claim 7. Guerra discloses the scan lens is a liquid immersion scan lens and there is an immersion liquid between said scan lens and said object when said system is operational. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the teachings of Dixon et al. with the arrangement of Guerra to provide a larger numerical aperture improving the image quality.

With respect to claim 13, Guerra shows a sidewall (36) surrounding objective lens (10'), said sidewall extending between said scan lens and said object (S), said sidewall having a substantial sealing relationship with said scan lens and said object to retain said immersion liquid (32) of said liquid-immersion scan lens between said scan lens and said object (fig. 13). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the teachings of Dixon et al. and Engelhardt et al. to provide a sidewall to contain the immersion liquid. One would be motivated to do this to allow for easy application and containment of the immersion liquid.

Double Patenting

Claims 1-3, 7, 8, 13-15, 18, 21, 22, 25, 26, and 41 of this application conflict with claims 1, 2, 7, 9, 11-13, 19, 20, and 22 of Application No. 10/608,217. 37 CFR 1.78(b) provides that

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when two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application. Applicant is required to either cancel the conflicting claims from all but one application or maintain a clear line of demarcation between the applications. See MPEP § 822.

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-3, 7, 8, 13-15, 18, 21, 22, 25, 26, and 41 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 2, 7, 9, 11-13, 19, 20, and 22 of copending Application No. 10/608,217 in view of Engelhardt et al. (US Patent No. 6,285,019).

With respect to claims 1 and 7, Application No. 10/608,217 claims almost all the same limitations in claim 1 including an imaging system for imaging objects, the system comprising: (a) an illumination source; (b) a liquid-immersion scan lens; (c) a scanner; (f) a detector and a display. Engelhardt et al. teaches an objective lens system for a confocal scanning microscope wherein a scan lens being movable relative to an object to achieve coarse focusing and a focusing lens is moved relative to a scan lens for fine focusing. At the time the invention was

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made, it would have been obvious to a person of ordinary skill in the art to modify claim 1 of Application No. 10/608,217 with the teachings of Engelhardt et al. to allow the system to scan an object in three dimensions without having to object relative to the microscope objective during scanning.

Likewise, with respect to claims 2, 3, and 14, Engelhardt et al. teaches these further limitations and would be obvious to modify claim 1 of Application No. 10/608,217 to meet these limitations for reasons stated supra.

Also, claim 8 is an obvious variation of the structure provided by claim 2 of copending Application No. 10/608,217.

Further, claims 13, 15, 18, 21, 25, and 26 state the same limitations as claims 13, 7, 9, 11, 20, and 19, respectively, of copending Application No. 10/608,217.

Finally, claim 41 is an obvious combination of claims 1 and 22 of copending Application No. 10/608,217 and the Engelhardt et al. reference for reasons stated supra.

This is a provisional obviousness-type double patenting rejection.

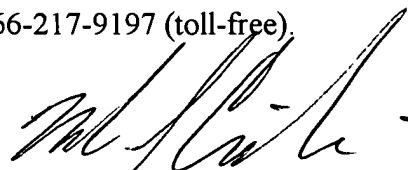
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Consilvio whose telephone number is (571) 272-2453. The examiner can normally be reached on Monday thru Friday, 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on (571) 272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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